

Converting Modular Smart Array 500 to a Modular Smart Array 1000 SAN for additional scalability

HOWTO, 2nd edition



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Abstract

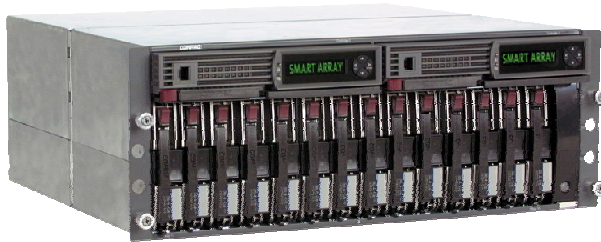
The HP StorageWorks Modular Smart Array 500 (MSA500) offers 2-node clustering, Recovery Server, and up to 4-node shared storage support at SCSI economics, while providing high data availability with redundant controllers and multi-path I/O technology. As your storage requirements evolve and you need to expand your storage system to greater capacity or to attach more than four servers, the Modular Smart Array 500 is easily convertible to a SAN because it is based on DAS-to-SAN (DtS) technology.

This "how-to" details the steps to convert a Modular Smart Array 500 to a Modular Smart Array 1000 (MSA1000) in a direct attached environment.

Introduction

The Modular Smart Array 500 (Figure 1) is an enclosure supporting 2-node clustering or shared direct attached storage at SCSI economics, while providing high data availability with redundant controllers and multi-path I/O technology. Because Modular Smart Array 500 is based on the familiar SCSI technology, there are no additional infrastructure requirements such as hubs, switches, and cables.

Figure 1. Modular Smart Array 500 system



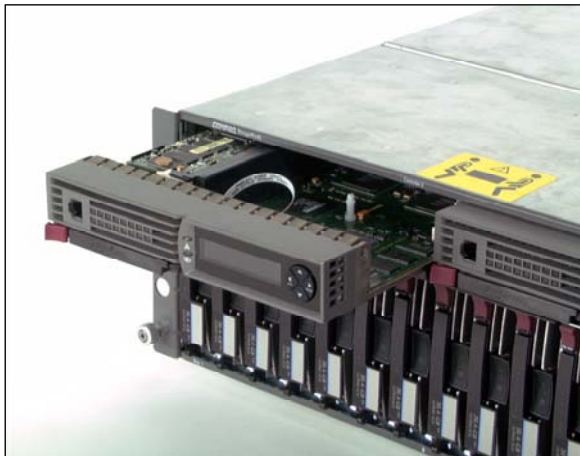
This allows for a low initial investment for a high availability system supporting up to 2 terabytes (TB) of data and up to four servers. As your storage requirements evolve and you want to implement a Fibre Channel solution for additional scalability such as multi-cluster functionality, the Modular Smart Array 500 is easily convertible to a SAN.

The Modular Smart Array 500 system offers DAS-to-SAN (DtS) technology, a quick-and-easy way to convert the Modular Smart Array 500 system to the HP StorageWorks Modular Smart Array 1000 when customer requirements change. Modular Smart Array 1000, built upon Smart Array technology, is the first generation 2-gigabyte (GB) Fibre Channel storage system designed for the mid-range Storage Area Network (SAN). Designed to reduce the complexity, expense, and risk of SAN deployments in a heterogeneous x86 server environment, the Modular Smart Array 1000 provides the customer a scalable storage system with investment protection in mind.

To convert the Modular Smart Array 500 system to a SAN, customers simply remove the Modular Smart Array 500 controller(s) (Figure 2), replace them with StorageWorks Modular Smart Array 1000 controller(s), and add a Fibre Channel I/O board or Fibre Channel switchboard.

This "how-to" explains the path customers can take to migrate to a Storage Area Network (SAN). The migration procedures cover converting a base-configured Modular Smart Array 500 to a base-configured Modular Smart Array 1000.

Figure 2. Hot-pluggable Modular Smart Array 500 controller



To add redundant controllers, redundant switches, and redundant Host Bus Adapters (HBA), or to setup other advanced configurations, refer to the HP StorageWorks Modular Smart Array 1000 User Guide, which is available online at

<http://h18000.www1.hp.com/products/storageworks/msa1000/documentation.html>.

Requirements

For a successful migration, you must have one Modular Smart Array 500 product directly connected to a ProLiant server running any of the following operating systems:

- Microsoft operating systems: Microsoft Windows Server 2003 Enterprise Edition, Microsoft Windows Server 2003 Standard Edition, Microsoft Windows 2000 Server, Microsoft Windows 2000 Advanced Server, Microsoft Windows NT 4.0 Server, or Microsoft Windows NT 4.0 Enterprise Edition
- Linux operating systems: United Linux 1.0, Red Hat Linux Enterprise Server 2.1, Red Hat Linux Advanced Server 2.1, Red Hat Linux 8.0, Red Hat Linux 7.3, or Red Hat Linux 7.2
- Novell operating systems: Novell NetWare 6.5, 6 or 5.1

Note

Visit www.hp.com for the latest compatibility.

Table 1 and Table 2 list additional hardware and software requirements.

Table 1. Minimum hardware requirements

<input checked="" type="checkbox"/>	Hardware
<input type="checkbox"/>	FCA2101 HBA, FCA2210, FCA2214
<input type="checkbox"/>	Fibre Channel Cables
<input type="checkbox"/>	Modular Smart Array 1000 Controller ¹
<input type="checkbox"/>	Modular Smart Array Fibre Channel I/O Module ² or MSA SAN Switch 2/8

Table 2. Minimum software requirements

<input checked="" type="checkbox"/>	Software
<input type="checkbox"/>	MSA1000 Firmware (available for download from http://h18023.www1.hp.com/support/files/server/us/locate/5664.html)
<input type="checkbox"/>	MSA1000 Support Software Version 5.31 CD (from the Modular Smart Array 1000 Setup & Management Kit)

Conversion from a Modular Smart Array 500 to a Modular Smart Array 1000 can only take place when:

- Both the Modular Smart Array 500 and the Modular Smart Array 1000 support the operating system.
- Available PCI slots in the ProLiant server support Fibre Channel Host Bus Adapters.

Migration procedures

The instructions in this section provide detailed information to guide you through the migration process. These procedures assume that, as a precaution, you have backed up the data on your system before removing power.

1. Power down server(s) and Modular Smart Array 500.
2. Remove the Modular Smart Array 500 controller from the front of the Modular Smart Array 500 and install the Modular Smart Array 1000 controller in its place.

Note

If only one Modular Smart Array 500 controller resides in the original system, place the Modular Smart Array 1000 controller in the same slot. If two Modular Smart Array 500 controllers reside in the system, then replace both controllers with MSA1000 controllers. Modular Smart Array 1000 requires Secure Path Software to support redundant controllers (see the StorageWorks Modular Smart Array 1000 User Guide).

¹ The LCD will display the existing configuration. You must order the same number of controllers that you have in your existing configuration.

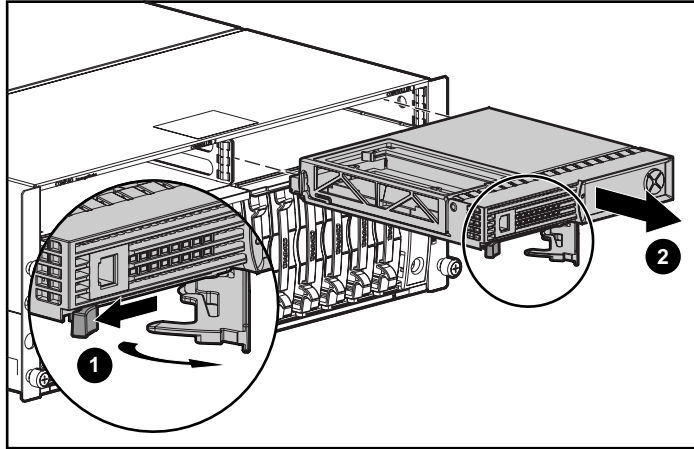
² The LCD will display the existing configuration. You must order the same number of modules that you have in your existing configuration.

Task 1: Removing the Modular Smart Array 500 Controller

(See Figure 3)

1. Press the controller's thumb latch, and pull the latch handle toward you ❶.
2. Remove the Modular Smart Array 500 Controller by pulling it straight out of the chassis ❷.

Figure 3. Removing the Modular Smart Array 500 Controller

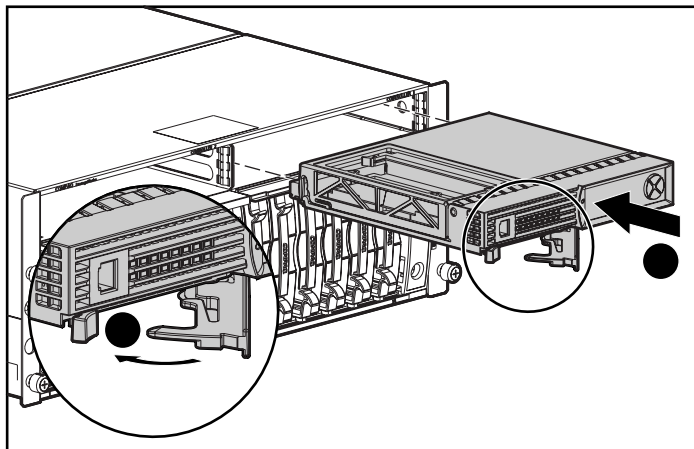


Task 2: Inserting the Modular Smart Array 1000 Controller

(See Figure 4)

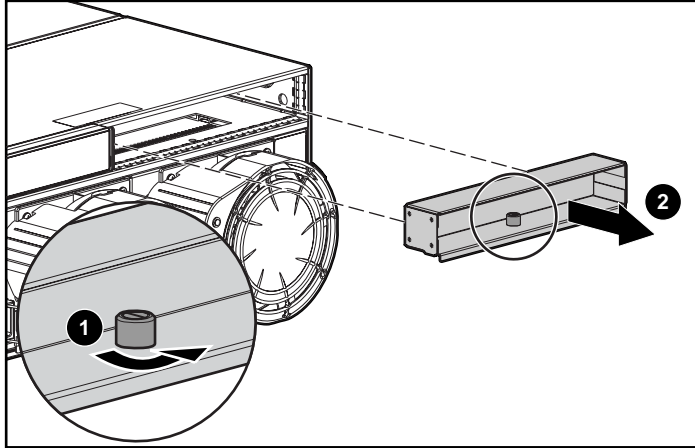
1. Insert the Modular Smart Array 1000 Controller into the chassis ❶.
2. Push the controller in as far as it will go, and press the latch inwards until it is flush against the front panel ❷.

Figure 4. Installing the Modular Smart Array 1000 Controller



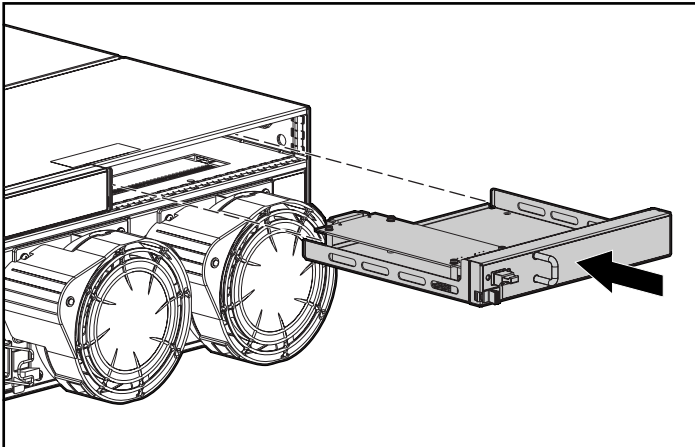
3. Disconnect the SCSI cable(s) from the Modular Smart Array 500 system and server(s).
4. Remove the blanking panel from the back of the Modular Smart Array 500 by loosening the thumbscrew that holds the panel in place ❶ and remove the panel from the back of the unit ❷ (see Figure 5).

Figure 5. Removing the blanking panel



5. Insert the Modular Smart Array Fibre Channel I/O Module (or add the MSA Fabric Switch 2/8) into the same slot as the active controller³, sliding it in as far as it will go and pressing in firmly to ensure the module is securely seated with the controller (Figure 6).

Figure 6. Inserting the I/O module



³ The term *active controller* refers to the controller currently installed in the front slot where the new module or switch should be placed.

Note

The MSA Fabric Switch 8 is an optional six port, 2-GB/s Fibre Channel Fabric Switch. The MSA Fabric Switch 8 replaces the standard single port Fibre Channel connection provided by the Modular Smart Array Fibre Channel I/O Module. For more information, refer to the MSA Fabric Switch 8 User Guide, which is available online at <http://h18000.www1.hp.com/products/storageworks/msa1000/documentation.html>.

6. Install the FCA2101, FCA2210, or FCA2214 HBA in the server slot and attach the fiber optic interconnect component for appropriate communication to the Modular Smart Array 1000. Ensure that all interconnect components are in place for proper communication from the FCA2101 to the Modular Smart Array 1000.
Repeat this step for additional servers.
 7. Connect the FCA2101, FCA2210, or FCA2214 HBA in the server to the Modular Smart Array Fibre Channel I/O Module(s) in the back of the Modular Smart Array 1000 using fibre channel cables.
-

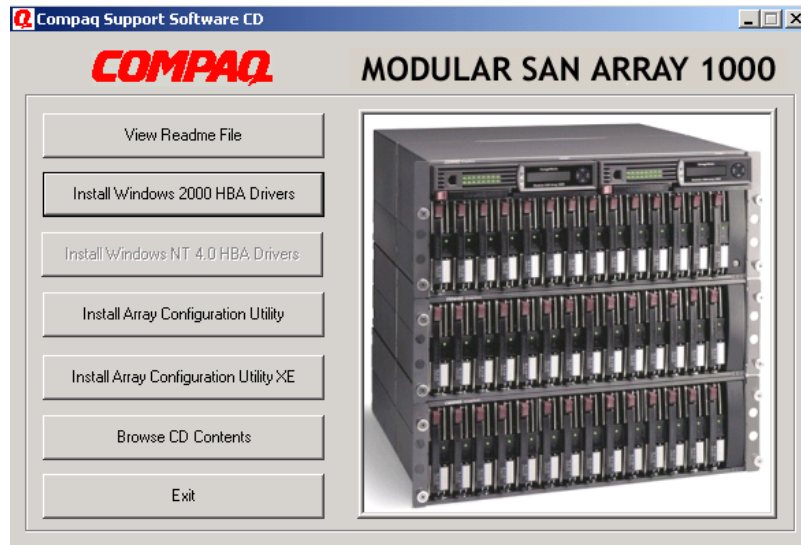
Note

If using a switch (or dual switches), connect the Fibre Channel HBA(s) from the server and the Modular Smart Array Fibre Channel I/O Module to the switch(es).

Repeat step 7 for additional servers.

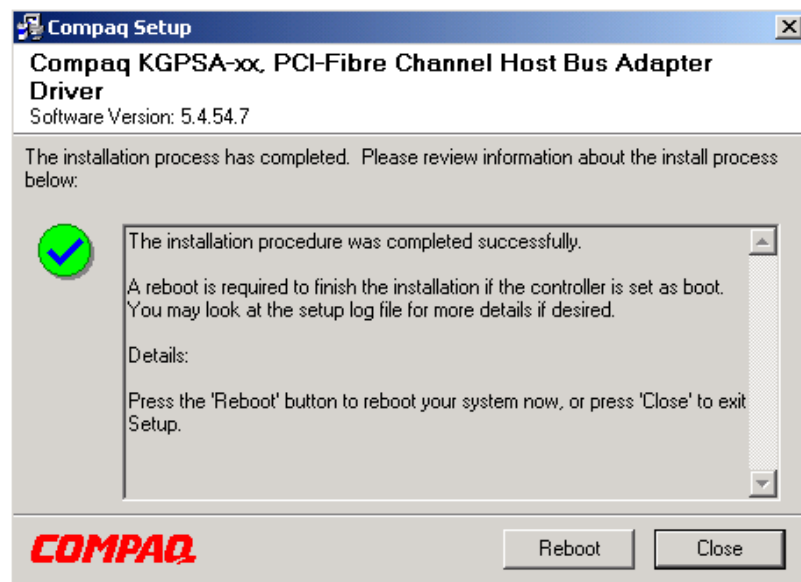
8. Power on the Modular Smart Array 1000. The LCD should display a message stating, "Compaq MSA1000 Startup Complete."
9. Power on the server.
10. After the server reboots, a New Hardware Found message will appear. Click the **Cancel** button.
11. Insert the Modular Smart Array 1000 Support Software Version 5.31 CD in the CD-ROM drive of the server.
12. After reading the license agreement, click **Agree**.
13. Click the **Install Windows 2000 HBA Driver** button on the Support Software CD screen (see Figure 7).

Figure 7. MSA1000 dialog box



14. Click the Install button on the Setup screen (see Figure 8).

Figure 8. MSA1000 install dialog box



15. Right-mouse click on **My Computer**, and select **Manage**.
16. Select **Disk Management** under Storage. You should be able to see the volumes on the Modular Smart Array 1000.
17. Use the LCD to check the firmware version for the Modular Smart Array 1000 and compare this version to the latest version available for download at <http://h18000.www1.hp.com/support/files/server/us/locate/5664.html>. If the latest version is not installed on the MSA1000, download the firmware from the Web and install it.

Troubleshooting tips

This section provides tips for troubleshooting some common problems found in HP labs regarding the migration of Modular Smart Array 500 to Modular Smart Array 1000.

Methodology

This section lists basic methodology to use when troubleshooting. First, gather the information to resolve the issue. Ask the following questions:

1. Is the problem reproducible or random?
2. What hardware and/or software is involved?
3. Were any errors made in the implementing steps?
4. Was more than one variable changed at a time?
5. Does the problem occur on the server or is it specific to the storage box?
6. Were any steps skipped or completed out of order?
7. Were any steps accidentally added?
8. Were any steps added intentionally to complete or correct another step? Place checkmarks against the steps as they are/were executed. If steps had to be added on the fly in order to proceed, record why and where.

After asking the questions, complete the following steps to resolve the issue:

1. Decide on one cause and possible solution at a time. Make appropriate modifications and then test those modifications. Try to minimize the number of things you change between tests.
2. Test each modification to see if it fixed the problem.
3. Write down all symptoms, causes, and solutions. Having a written record makes an excellent reference for future troubleshooting.

Common issues

For common issues that might occur during the migration, refer to Chapter 2, "Operation and Troubleshooting" of the HP StorageWorks Modular Smart Array 1000 User Guide, available online at <http://h18000.www1.hp.com/products/storageworks/msa1000/documentation.html>.

Conclusion

The Modular Smart Array 500 system is the ideal platform for direct attached and 2-node clustering: It minimizes initial infrastructure cost by not requiring a Fibre Channel network until necessary. But as your storage requirements evolve and you want to implement a Fibre Channel solution for greater scalability, the Modular Smart Array 500 is easily convertible to a SAN because it is based on unique HP DfS technology, allowing for a seamless conversion path from Modular Smart Array 500 to the Modular Smart Array 1000. This migration eliminates initial SAN deployment complexity, lowers cost of ownership, and provides investment protection.

For more information

The table below provides links to the resources referenced in this document and additional information that might be helpful in planning a SAN migration.

Resource Description	Web Address
Product information	
The HP Modular Smart Array 500 site includes product information in the form of demos and documentation.	http://h18000.www1.hp.com/products/servers/proliantstorage/sharedstorage/index.html
The HP Modular Smart Array 1000 site includes product and support information.	http://h18000.www1.hp.com/products/storageworks/msa1000/index.html
Product Documentation	
The HP Modular Smart Array 500 QuickSpecs contain an overview, the standard features, the TechSpecs, and configuration information for this product.	http://h18000.www1.hp.com/products/quickspecs/11050_na/11050_na.HTML
The HP StorageWorks Modular Smart Array 1000 QuickSpecs contain an overview, the standard features, the TechSpecs, and configuration information for this product.	http://h18000.www1.hp.com/products/quickspecs/11033_na/11033_na.HTML
The hp StorageWorks Modular Smart Array 1000 User Guide provides step-by-step instructions for installation and should be used as a reference for operation, troubleshooting, and future upgrades.	http://h18000.www1.hp.com/products/storageworks/msa1000/documentation.html
The Modular Smart Array 500 Technology white paper discusses the Modular Smart Array 500 solution.	ftp://ftp.compaq.com/pub/supportinformation/papers/tc020201wp_rev0_us.pdf
Software downloads	
The hp software and drivers site allows downloading of the latest support software, drivers, utilities, and agents and provides information about software enhancements and fixes.	http://h18023.www1.hp.com/support/files/server/us/index.html
The Array Configuration Utility for Windows 2000, a GUI-based application, helps you configure SMART-2 Array Controllers, Smart Array Controllers, Integrated Smart Array Controller, and StorageWorks RAID Array Controllers.	http://h18023.www1.hp.com/support/files/server/us/locate/2012.html
The hp ProLiant Array Configuration Utility for Windows, a Web-based application, helps you configure SMART-2 Array Controllers, Smart Array Controllers, Integrated Smart Array Controller, and StorageWorks RAID Array Controllers.	http://h18023.www1.hp.com/support/files/server/us/locate/3271.html

Call to action

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